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Luna B. Leopold

Geographical Review, Vol. 41, No. 2 (Apr., 1951), 295-316.

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Geographical Review is currently published by American Geographical Society.

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VEGETATION OF SOUTHWESTERN WATERSHEDS IN THE NINETEENTH CENTURY*

LUNA B. LEOPOLD

THE recollections of many old-timers who tell of grass "stirrup high" have given rise to the idea that vegetation in the Southwest was uniformly better in the middle of the last century than it is at present. The change is usually attributed to overgrazing, which timed if it did not cause extensive gullying of the alluvial valleys,[1] lowering the water table and decreasing the availability of water for plant use. This idea of an originally verdant vegetation, deteriorated as a result of man's activities, has led to overoptimism concerning the possible results of reduced grazing. Obviously, any decrease in grazing pressure is a step in the right direction, but it is no exaggeration to say that the recovery of vegetation density on depleted ranges, even after protection for years, has been spotty and, in many places, disappointing. We may have allowed ourselves to be deluded by hopes of "restoring" over large areas a level of vegetation density that was originally attained only in selected localities.

This conclusion is supported by the published diaries and field notes of members of early American exploring parties. They show that in certain places, particularly in south-central Arizona where grass is now meager, the alluvial valleys formerly supported large expanses of grassland. However, there were also many areas, even alluvial valleys, where grass was so poor that forage for a string of horses could hardly be obtained. Other areas, such as the Rio Puerco Valley, supported good grass in some places but only scattered shrubs, furnishing poor forage, in others, though until well past the middle of the nineteenth century extensive grazing had been prevented by frequent raids of hostile Indians.

METHOD OF INVESTIGATION

To determine the general conditions of vegetation in pre-grazing days in the Southwest and what changes, if any, have occurred in the last 50

* The writer acknowledges the help of the late Dr. Kirk Bryan and Dr. Derwent Whittlesey, who read the manuscript and made valuable suggestions. Discussions in the field with Mr. W. B. Langbein and Mr. H. V. Peterson were stimulating; their assistance is gratefully acknowledged.

[1] Geological evidence has shown that in pre-settlement times valleys experienced periods of erosion followed by compensating sedimentation. The few centuries prior to the beginning of heavy grazing were characterized by aggradation.

➤ DR. LEOPOLD is Hydraulic Engineer with the United States Geological Survey.

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He mentioned cottonwoods on the banks of the Puerco but did not further refer to the channel condition. On his return in February he said the Puerco was "running a brisk but muddy stream" (p. 83).

At the junction of the Puerco del Oeste and the Little Colorado "grass [is] plentiful in the bottoms, as well as on the hills . . . There is abundance of large cotton-wood trees in the bottom, which resembles . . . the Rio Grande" (p. 41).

Between Holbrook and Winslow, Beale cut down the banks of two arroyos "to admit the passage of our wagons" (p. 43).

Bourke,[33] who attended the Hopi snake dance in 1881, observed vertical-walled arroyos in the watershed of the Polacca, which Thornthwaite, Sharpe, and Dosch[34] have interpreted as being discontinuous forerunners of the much deeper and longer trench existing now. Bourke noted poor grass and cedar near the Hopi villages where grazing and woodcutting had taken a heavy toll. There were, however, large areas of choice grama plains in certain parts.

Despite some mention of individual localities where grass was insufficient, both Beale in 1857 and Bourke in 1881 stand out among the travelers as being generally enthusiastic about the grazing conditions, particularly in the area between Gallup and Holbrook. The observers from 1846 to 1855, who primarily discussed central New Mexico, almost without exception were impressed with the lack of grazing everywhere except in the well-watered bottomlands.

Gila River Basin

The often-quoted narrative of Pattie's beaver trapping in the Gila in the 1820's is still the best early description of that area.[35] For the present study, however, it has the disadvantage of having been written some years after the field trips and thus cannot be as detailed and specific as might be desired.

Beaver occurred on the Gila at least as far as Phoenix, and on the Salt River to its mouth. The trapping was fine on the Colorado River below the mouth of the Gila (p. 148). Pattie states that the Red River (Colorado) at the junction with the Gila was "a deep bold stream, and at this point perfectly clear" (p. 92). This is the type of statement that should be taken with a grain of salt.

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[33] J. G. Bourke: The Snake-Dance of the Moquis of Arizona, New York, 1884, pp. 339–342.

[34] Thornthwaite and others, *op. cit.* (see footnote 2, above), p. 105.

[35] J. O. Pattie: The Personal Narrative of James O. Pattie edited by Timothy Flint, Cincinnati, 1833.

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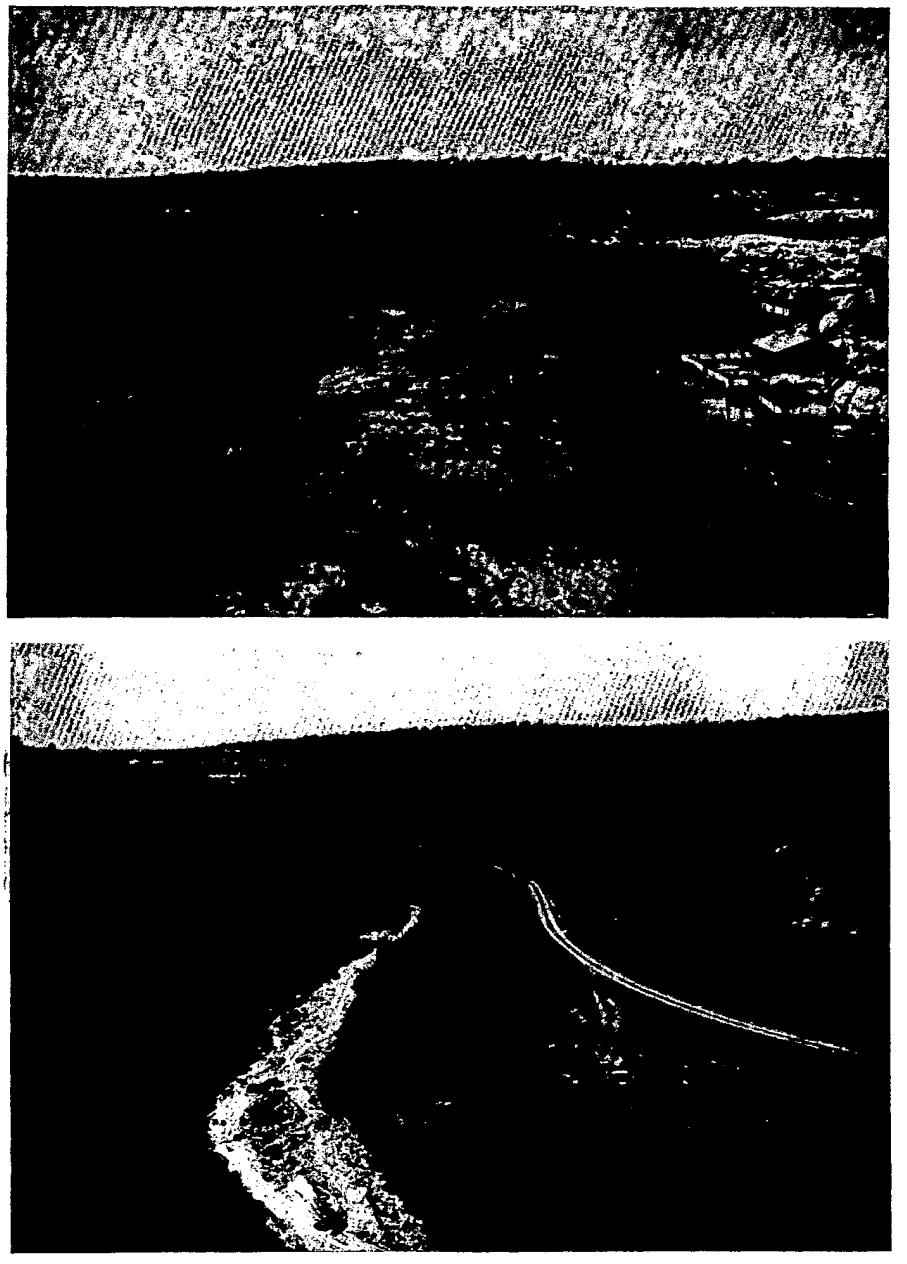

FIG. 4—Near site of Keams Canyon School, Navajo County, Ariz. Upper photograph, taken about 1895, shows a low density of vegetation on the valley floor as compared with the lower photograph, taken about 1940. Arroyo had already begun cutting in 1895 but increased greatly in size. Some reduction of juniper can be noted on hilltop in the later photograph. (Both photographs courtesy of Soil Conservation Service.)

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